CLINICAL MEANING OF METHODS FOR IDENTIFYING VARIABILITY OF MENTAL PROMINENCE LOCATION

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The mental prominence (protuberantia mentalis) narrows at the top turning into the mandibular symphysis (symphysis mentalis), which protrudes forward as a crest. The degree of the prominence varies widely, proof to that being the results of morphological studies focusing on the dentofacial area in general and the dentoalveolar segments in particular [1–3]. There has been a proposal to evaluate the angle between the base lower edge and the protrusion. This angle has been found to have a value of 46 to 85°. However, there is no indication of the anatomical points through which the lines are drawn to build the angles [4–6]. At the same time, the available classifications of the facial shapes and dental arches are rather detailed, despite the fact that they can be very diverse even under physiological occlusion [7–9]. The features of the dentofacial area with congenital and acquired anomalies have been shown [10–12]. Clinicians evaluate the mental prominence when analyzing the facial signs of pathology, where the major anthropometric reference points and diagnostic points are located. However, the degree of the mental prominence can introduce certain adjustments to the interpretation of the research outcomes. Besides, searching through the available literature we have found no clear recommendations for identifying the mental prominence degree on the lateral teleradiography. All of the above explains the aim and the objectives of this study.

Aim of study

To evaluate the clinical meaning of methods employed to identify the variability of the mental prominence location.

Material and methods

The material for the study included lower jaws anatomical preparations featuring various types of mental prominence. When making native preparations, a circular saw was used to cut the jaw in the chin area into segments along the interdental septa in the vestibular-lingual direction. The evaluation was done on the dentofacial segments of the mandibular medial incisors. The sides of the segments were studied relying on the anatomical and topographical approach. The specific feature of the technique was that within the medial and distal norms of each segment a line was drawn along the tooth clinical neck. Further, from the middle of the said line a perpendicular (conditional midline vertical) was drawn dividing the segment into two areas — vestibular and lingual. Next, on the vestibular surface of the segment, points of the top convexity and concavity of the mental prominence were identified to be connected with a straight line, which made an angle with the conditional midline vertical, and that we defined as the mental prominence convexity angle in the sagittal direction. In addition, teleradiographic data of the patients with physiological occlusion of the permanent teeth were studied. In assessing the teleradiography, the mandibular plane was drawn through the most prominent points of the mandible body. The medial incisor inclination axis reached the mandibular plane. The chin prominence was evaluated similarly to the first method. The mental prominence location analysis was done using the method of cone-beam computed tomography.

RESULTS AND DISCUSSION

The results of studying the dentition segments showed that the sagittal angle of the mental prominence convexity varied between 25 and 40° in case of the permanent teeth physiological occlusion. The disadvantage of this method was the complexity of manufacturing the segments, followed by photographing and combining the linear dimensions. The analysis of lateral teleradiography allowed evaluating different intravital positions of the mental prominence as well as to evaluate the results with respect to the anatomical landmarks and the main planes, both in the horizontal and in the vertical direction. When analyzing the lateral teleradiography, we identified two location options for the mental prominence in the vertical direction. In the first case, the mental prominence touched the mandibular plane, while in the second, it was located above that. The former location of the mental prominence made it possible to evaluate its convexity in the sagittal direction between the mandibular incisor conditional midline vertical and the line connecting the mental prominence top convexity and concavity spots, while this kind of evaluation could also be obtained from the maxillary segments images.

In the second type of the mental prominence location, in addition to the sagittal angle of the convexity, the vertical angle of the prominence was also evaluated between the mandible two tangent lines. The first tangent line ran from the top convexity point of the mandibular angle to the top convexity point on the mandible body. The second line was from the top convexity point of the the mandible body to the lowest point of the mental prominence (the "Me" point). The disadvantages of this method include the difficulty of identifying some anatomical landmarks and complex measurements using various devices (calipers and protractors of various modifications). The cone-beam computed tomography method, in our opinion, combined the advantages of the two methods also eliminating the disadvantages. Besides, a software application package allowed measuring and analyzing the study outcomes directly on the computer monitor.

Conclusion. The proposed methods allow not only determining the possible gnathic and dentoalveolar types of mandibular pathology, yet also determining the methods of orthodontic and surgical treatment, which can be used by clinicians in their practice.

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